



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/772,115

02/03/2004

Cullen E. Bash

200311131-1

4299

22879

7590

12/17/2004

HEWLETT PACKARD COMPANY  
P O BOX 272400, 3404 E. HARMONY ROAD  
INTELLECTUAL PROPERTY ADMINISTRATION  
FORT COLLINS, CO 80527-2400

EXAMINER

EDWARDS, ANTHONY Q

ART UNIT

PAPER NUMBER

2835

DATE MAILED: 12/17/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/772,115

Applicant(s)

BASH ET AL

Examiner

Anthony Q. Edwards

Art Unit

2835

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 03 February 2004.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-6 and 8-18 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-6, 8-12 and 14-18 is/are rejected.
- 7) ☒ Claim(s) 13 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 2-3-2004.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Drawings***

The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the coolant pump must be shown or the feature(s) canceled from the claim 4. No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### ***Claim Objections***

Claims 9 and 10 are objected to because of the following informalities: claim 9 recites "air mover....to pump air". Where applicant acts as his or her own lexicographer to specifically

Art Unit: 2835

define a term of a claim contrary to its ordinary meaning, the written description must clearly redefine the claim term and set forth the uncommon definition so as to put one reasonably skilled in the art on notice that the applicant intended to so redefine that claim term. *Process Control Corp. v. HydReclaim Corp.*, 190 F.3d 1350, 1357, 52 USPQ2d 1029, 1033 (Fed. Cir. 1999). The term “pump” in claim 9 is used in the claim to mean “push or pull as with a fan”, while the accepted meaning is “a device that raises, transfers or compresses fluids.” The term as used by the applicant is indefinite because the specification does not clearly redefine the term. Claim 10 depends from claim 9 and is therefore objected to for at least the same reasons. Appropriate correction is required.

### *Claim Rejections - 35 USC § 102*

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-3, 5, 9 and 14-18 are rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent 6,776,221 to Montgomery et al. (“Montgomery” hereinafter). Referring to claim 1, Montgomery discloses a modular computer system for mounting in a multi-tiered support (see Fig. 13), comprising a computer chassis (24) configured for mounting in the multi-tiered support, a computer component (58) within the computer chassis, an evaporator (62) in thermal communication with the computer component, the evaporator being configured to dissipate heat

Art Unit: 2835

from the component by evaporating liquid coolant from a stream of liquid coolant to produce a stream of coolant vapor, a condenser (28) configured to dissipate heat from the stream of coolant vapor to add liquid coolant to the stream of liquid coolant, and an air mover (102) configured to cool the condenser. See Figs. 1-3 and col. 5, lines 11-63.

Referring to claim 2, Fig. 1 of Montgomery shows a modular computer system, wherein the chassis is a 1U rackmount chassis.

Referring to claim 3, Montgomery discloses a modular computer system, wherein the evaporator and the condenser are configured as a gravity-driven, pump-less, closed-loop cooling system. See col. 5, lines 23-26.

Referring to claim 5, Montgomery discloses a modular computer system, wherein the condenser (24) defines a downward coolant pathway configured for the coolant to travel gravitationally downward while condensing from the stream of coolant vapor to the stream of liquid coolant. See Fig. 3 and the corresponding specification.

Referring to claim 9, Montgomery discloses a modular computer system, wherein the air mover (104) is further configured to pump (*sic*) air heated by the condenser out one or more exhaust vents (not numbered) in the chassis. See Fig. 7, which shows vents at back of rack/chassis.

Referring to claim 14, Montgomery discloses a modular computer system for mounting in a multi-tiered support (see Fig. 13), comprising a computer chassis (24) configured for mounting in the multi-tiered support, a computer component (58) within the computer chassis, a means for evaporating liquid coolant (62) from a stream of liquid coolant, using heat from the computer component, to produce a stream of coolant vapor, a means for removing heat (28) from

Art Unit: 2835

the stream of coolant vapor, and a means for transferring the removed heat (102) out of the chassis. See Figs. 1-3 and col. 5, lines 11-63.

Referring to claims 15-18, the method steps are necessitated by the device structure taught by Montgomery.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Montgomery in view of U.S. Patent No. 6,313,990 to Cheon. Montgomery discloses the invention as claimed, except for further comprising a coolant pump configured to pump coolant through the closed-loop cooling system. Cheon teaches providing a pump (52) to a closed-loop cooling system (see Fig. 2).

It would have been obvious to one of ordinary skill in the art at the time of the invention to provide a pump for the system of Montgomery, as taught by Cheon, since the device of Cheon would provide additional force to move the cooling fluid through the system based on the environmental parameters of the system.

Claims 6, 8, 11 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Montgomery in view of U.S. Patent No. 6,657,121 to Garner. Referring to claim 6, Montgomery discloses the invention as claimed, except for further comprising a second computer component

Art Unit: 2835

within the chassis, and a second evaporator in thermal communication with the second computer component. Garner teaches providing first and second computer component (15, 16) within a chassis (8), and first and second evaporators (70) in thermal communication with the second computer component, the second evaporator being configured to dissipate heat from the second component by evaporating liquid coolant from a stream of liquid coolant to produce a second stream of coolant vapor, wherein the condenser is configured to dissipate heat from the second stream of coolant vapor to add liquid coolant to the stream of liquid coolant (see Figs. 2 and 3, as well as col. 6, lines 52-62).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the system of Montgomery to include a second component and corresponding second evaporator, as taught by Garner, since the device of Garner would allow for more computing power, as well as the needed cooling capability, on a single server of the system of Montgomery.

Referring to claim 8, Montgomery in view of Garner disclose the system, wherein the stream of liquid coolant and the first stream of coolant vapor both extend from the first evaporator to the second evaporator through a common passage (42), and the first and second streams of coolant vapor intermix and extend from the second evaporator to the condenser through a common passage (42). See Fig. 2, and col. 6, lines 47-62 of Garner.

Referring to claims 11 and 12, Montgomery in view of Garner disclose the system, further comprising one or more additional computer components within the computer chassis (see Fig. 2 of Garner). Montgomery, as modified, does not specifically teach the air mover causing airflow that directly cools the one or more additional components, or the air mover blowing directly toward the one or more additional component, respectively. It is well known,

Art Unit: 2835

however, in the art of cooling systems for computer servers to rearrange parts where needed (see *In re Japikse*, 181 F.2d 1019, 86 USPQ 70 (CCPA 1950)). It would have been obvious to one of ordinary skill in the art at the time of the invention to further modify the device of Montgomery, such that the air mover causes airflow that directly cools the one or more additional components by blowing air directly toward the one or more additional component, since this would provide the optimum cooling conditions for the system.

Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Montgomery in view of U.S. Patent No. 5,528,454 to Niklos. Montgomery discloses the invention as claimed, except for the air mover being a plurality of fans extending across an intermediate portion of the chassis to define two chambers, the fans being configured to move air from a first chamber of the two chambers to a second chamber of the two chambers, and the chassis exhaust vents ventilate the second chamber. Niklos teaches providing a fan array (see Fig. 1), having a plurality of fans (9-11) for cooling component within a computer chassis (16). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the device of Montgomery to include a plurality of fans, as taught by Niklos, since the device of Niklos would provide cooling over a larger surface area of chassis of Montgomery.

Likewise, since it is well known in the art of cooling systems for computer servers to rearrange parts where needed (see *In re Japikse*, 181 F.2d 1019, 86 USPQ 70 (CCPA 1950)), it would have been obvious to one of ordinary skill in the art at the time of the invention to further modify the device of Montgomery, such that the plurality of fans extend across an intermediate portion of the chassis of Montgomery to define two chambers, wherein the fans are configured to move air from a first chamber of the two chambers to a second chamber of the two chambers,



Art Unit: 2835

and the chassis exhaust vents ventilate the second chamber, since this arrangement would provide cooling needs specifically desired by the user.

### *Allowable Subject Matter*

Claim 13 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The following is a statement of reasons for the indication of allowable subject matter: the specific limitation of the air mover drawing air through the condenser, and blowing air toward the one or more additional computer, in combination with the rest of the elements or steps, are not taught or suggested by the prior art references.

### *Conclusion*

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anthony Q. Edwards whose telephone number is 571-272-2042. The examiner can normally be reached on M-F (7:30-3:00) First Friday Off.

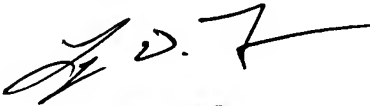
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lynn D. Feild can be reached on 571-272-2800, ext. 35. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Art Unit: 2835

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

December 13, 2004

aqe



**LYNN FELD**  
**SUPERVISORY PATENT EXAMINER**  
**TECHNOLOGY CENTER 2800**